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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,192	03/29/2004	Riad I. Hammoud	DP-310844	5826
<div>7590 03/30/2007 STEFAN V. CHMIELEWSKI DELPHI TECHNOLOGIES, INC. Legal Staff MC CT10C P.O. Box 9005 Kokomo, IN 46904-9005</div>			<div>EXAMINER PINKNEY, DAWAYNE</div>	
			<div>ART UNIT 2873</div>	<div>PAPER NUMBER</div>
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/30/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/813,192

Applicant(s)

HAMMOUD, RIAD I.

Examiner

DaWayne A. Pinkney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 03/29/2004. **§ 4-20-04**
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 03/29/2004 was considered by the examiner.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Aboutalib et al. (US 5, 859, 686).

Regarding **claim 1**, Aboutalib discloses, a method of tracking movement of a subject's eye between first and second successively generated video images after a position of the subject's eye in said first video image has been identified, comprising the steps of:

defining a first state vector for the first video image corresponding to the identified position of the subject's eye (Column 6, lines 45-51);

defining an eye template in said second video image based on said first state (Column 6, lines 51-61), and defining a search window comprising said eye template and a portion of the second video image surrounding said eye template (Column 9, lines 6-13 and Column 10, lines 56-64);

forming a difference image corresponding to differences between said search window and a corresponding portion of said first video image (Column 11, lines 3-12);

processing said difference image to detect a specified movement of the subject's eye and a corresponding center of movement (Column 11, lines 13-31);

if the specified movement of the subject's eye is not detected, defining a second state vector corresponding to the location of the subject's eye in the second video image based on a correlation technique (Column 4, lines 2-11); and

if the specified movement of the subject's eye is detected, defining the second state vector based on the corresponding center of movement (Column 4, lines 24-31).

Regarding **claim 2**, Aboutalib discloses, the method of claim 1, including the steps of:  
computing a sum of absolute differences between said search window and a corresponding portion of said first video image (Column 10, lines 56-64); and

setting said second state vector equal to said first state vector if the computed sum of absolute differences is less than a predefined threshold (Steps 302-324 of Figs. 3A, B and C).

Regarding **claim 3**, Aboutalib discloses, the method of claim 1, wherein the step of processing said difference image includes the steps of:

identifying candidate regions of said difference image that are size-wise consistent with facial features of the subject (Column 1, lines 59-67 and Column 2, lines 1-40);

establishing an eye model defining image characteristics of the subject's eye and a non-eye model defining image characteristics of facial features other than the subject's eye (Column 1, lines 59-67 and Column 2, lines 1-7);

computing deviations of a selected candidate region from said eye model and said non-eye model (Column 1, lines 59-67 and Column 2, lines 1-40); and

detecting the specified movement of the subject's eye when the deviation of the selected candidate region from the non-eye model is greater than the deviation of the selected candidate region from the eye model (Column 2, lines 41-64).

Regarding **claim 4**, Aboutalib discloses, the method of claim 3, including the steps of:  
successively selecting said candidate regions (Column 10, lines 40-51); and  
detecting the specified movement of the subject's eye when at least one of the selected candidate regions has a deviation from the non-eye model that is greater than its deviation from the eye model (Column 11, lines 47-58).

Regarding **claim 5**, Aboutalib discloses, the method of claim 3, including the step of:  
detecting said center of movement in accordance with a centroid of the selected candidate region (Column 9, lines 36-48).

Regarding **claim 6**, Aboutalib discloses, the method of claim 1, wherein the step of defining the second state vector based on a correlation technique includes the steps of:

computing correlation values based on a comparison of said eye template with different regions of said search window, and selecting a first region for which the computed correlation value is highest (Column 4, lines 2-24);

establishing an eye model defining image characteristics of the subject's eye and a non-eye model defining image characteristics of facial features other than the subject's eye (Column 1, lines 59-67 and Column 2, lines 1-7);

computing deviations of the search window regions from said eye model, and selecting a second region for which the computed deviation is lowest (Column 4, lines 45-67);

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defining the second state vector according to a center of the first selected region if said first selected region is determined to be more reliable than said second selected region (Column 11, lines 4-31); and

defining the second state vector according to a center of the second selected region if said second selected region is determined to be more reliable than said first selected region (Column 11, lines 65-67 and Column 12, lines 1-22).

Regarding **claim 7**, Aboutalib discloses, the method of claim 6, including the step of:

determining that said first selected region is more reliable than said second selected region when the correction value corresponding to said first selected region exceeds a correlation threshold, and the deviation of said second selected region from said eye model is greater than a deviation of the second selected region from said non-eye model (Column 11, lines 4-31).

Regarding **claim 8**, Aboutalib discloses, the method of claim 6, including the step of:

determining that said second selected region is more reliable than said first selected region when the correction value corresponding to said first selected region is less than a correlation threshold, and the deviation of said second selected region from said eye model is less than a deviation of the second selected region from said non-eye model (Column 11, lines 65-67 and Column 12, lines 1-22).

Regarding **claim 9**, Aboutalib discloses, the method of claim 6, including the steps of:

computing a first variance of search window patches surrounding a center of the first selected region, and a second variance of search window patches surrounding a center of the second selected region (Column 7, lines 23-28, 41-46 and 49-56);

determining that said first selected region is more reliable than said second selected region when the first variance exceeds the second variance (Column 11, lines 4-31); and

determining that said second selected region is more reliable than said first selected region when the second variance exceeds the first variance (Column 11, lines 65-67 and Column 12, lines 1-22).

### *Conclusion*

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The flowing disclosures substantially teach eye movement tracking between first and second generated images in which the position of the subject's eye is identified in the first image:

Hutchinson (US 4, 973, 149)

Ogawa (US 6, 571, 002)

Gerhardt et al. (US 5, 481, 622)

Kondo et al. (US 2003/0118217)

Durnell (US 2004/0196433)

Chernyak (US 7, 044, 602)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DaWayne A. Pinkney whose telephone number is (571) 270-1305. The examiner can normally be reached on Monday-Thurs. 8 a.m.- 4:30 p.m..

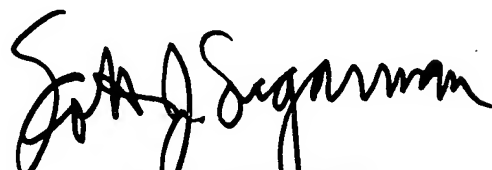
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



DAP



Scott J. Sugarman  
Primary Examiner